I claim:

1. A partially-open extra-ordinary low operating pressure power cogeneration system and apparatus means employed to convert supplied fuel energy sources into mechanical or electric energy and wherein the system accompanying developed residual thermal heat energy from one or more portions of the described system are usefully transferred to other facility supplied thermal fluid streams connected to the system, the said partially-open system and apparatus means hereafter referred to as the AES Power Cogeneration System comprising:

(a) a partially-open power cogeneration system having controlled mass flow streams of low pressure working motive fluid gases and power system exhaust that comprises a highly superheated preferred mixture of predominant carbon dioxide and water vapor in Mol percent ratio proportions identical to that of the carbon dioxide and water vapor generated from oxy-fuel combustion of a preferred gaseous or liquid hydrocarbon fuel;

(b) a partially-open power cogeneration system having a heavily predominant portion of its highly superheated temperature turbine exhaust heat transferred to the low pressure working motive fluid to develop a working motive fluid temperature that is slightly less than the temperature of the exhaust gases exiting from the power turbine assembly, thereby greatly contributing to the system's unconventionally high thermal efficiency;

(c) a modified conventional gas turbine assembly unit or other alternative combined individual series-connected equipment apparatus means that therein can re-pressurize a heavily predominant and controlled flow portion of low superheat

temperature re-circulated oxy-fuel combustion system exhaust gases that are subsequently greatly increased in temperature to form the working motive fluid;

(d) a partially-open power cogeneration system having individual flow controlled low pressure streams of highly superheated working motive fluid gases introduced into the system's oxy-fuel fired combustion burner assembly where therein the working motive fluid gases are mixed with valve-controlled streams of fuel and predominant oxygen to produce a high velocity stream of increased temperature superheated working motive fluid composition combustion gases that are directed through hot gas expansion power turbine assembly means to produce mechanical output power and residual superheated exhaust gas thermal energy, said mechanical output power produced at unconventionally high simple-cycle thermal efficiencies;

(e) one or more AES Power Cogeneration System exhaust residual heat recovery exchanger means for maximizing the overall system's unconventionally high thermal efficiencies;

(f) a power cogeneration system and apparatus means wherein during steady-state system operation, the open-portion of the cycle comprises the valve-controlled venting of excess low superheat temperature re-circulated system exhaust gases therein having a mass flow rate equivalent to the combined mass rates in which controlled flow streams of fuel and predominant oxygen gas mixture are admitted into the system apparatus' oxy-fuel combustion burner assembly;

(g) a power cogeneration system and apparatus means with alternative added supplementary heater apparatus within the closed-portion of the system whereby the production quantity of steam or heated water or heating of process fluids for a

facility can be independent of the amount of residual exhaust heat being produced by the turbine power producing portion of the system;

(h) a partially-open power cogeneration system having individual first and second controlled low pressure flow streams of highly superheated working motive fluid gases introduced into the system's oxy-fuel fired combustion burner assembly, said second controlled stream providing the means for controlling a combined preset maximum primary combustion flame zone and outer secondary zone equilibrium temperature, said first stream providing the means for a controlling a tertiary zone temperature flow of exhausted working motive fluid composition gases that are directed into the downstream inlet of the hot gas expansion turbine assembly;

(i) a power cogeneration system and apparatus means with master PLC based control panel and system devices employed for the safe control and monitoring of fluid stream flow conditions and operating apparatus equipment in accordance with accepted industry published standards and governmental codes;

2. A partially-open power cogeneration system and apparatus means of claim 1, wherein the individual second controlled low pressure streams of highly superheated working motive fluid gases introduced into the system's oxy-fuel fired combustion burner assembly therein provides the means for a controlled preset maximum primary inner flame and outer secondary combustion zone temperature that enables a non-distribution quality of gaseous or liquid hydrocarbon fuel (containing toxic and/or difficult to combust hydrocarbon molecular components) to be rapidly carried through a completed oxy-fuel combustion process for a useful heat conversion and/or completed incineration of said components.

3. A modified conventional gas turbine assembly unit or other alternative combined individual series-connected equipment apparatus means that therein can re-pressurize a heavily predominant and controlled flow portion of low superheat temperature re-circulated oxy-fuel combustion system exhaust gases of claim 1, wherein the alternative means of re-pressurizing recycled system exhaust gases can be accomplished with separately-driven gas compressor apparatus means that can include compressor styles including those of the axial, centrifugal, or positive displacement types.

4. A modified conventional gas turbine assembly unit or other alternative combined individual series-connected equipment apparatus means that therein can re-pressurize a heavily predominant and controlled flow portion of low superheat temperature re-circulated oxy-fuel combustion system exhaust gases of claim 1, wherein a oxy-fuel combustion burner assembly means can comprise either one or more modified combustion chamber means within a conventional gas turbine unit design or can comprise a alternative modified conventional commercial/industrial burner assembly means designed for preferred axially-positioned close connection to a hot gas expansion power turbine assembly to produce mechanical output power and residual superheated exhaust gas thermal energy.

5. A partially-open power cogeneration system and apparatus means of claim 1, wherein the recited one or more AES Power Cogeneration System exhaust residual heat recovery exchanger means can comprise parallel-positioned exhaust residual heat recovery exchanger means that can have individual flow controlled exhaust flows through each exchanger having preferred flow-control damper valves or other means positioned in each exchanger's outlet exhaust gas conduit having a reduced temperature.

6. A partially-open power cogeneration system and alternative added supplementary heater apparatus within the closed-portion of the system of claim 1, wherein an alternative added commercial/industrial oxy-fuel combustion burner assembly system can be close-connected to a present system's integrated heat exchanger inlet exhaust gas conduit to produce additional steam or hot water or process fluid heating capacities, the said added alternative oxy-fuel combustion burner assembly system therein including exhaust gas blower means for slightly re-pressurizing a flow-controlled portion of the total cogeneration system's re-circulated exhaust at reduced superheat temperature for downstream subsequent blending with controlled flows of fuel and oxygen within the said burner assembly.

7. A modified conventional gas turbine assembly unit or other alternative combined individual series-connected equipment apparatus means of claim 1, wherein the hot gas expansion power turbine assembly means can be either as employed in conventional gas turbine unit assemblies or alternatively comprising one of a variety of currently manufactured assembly configuration types of hot gas expander devices that are not employed within conventional gas turbine cogeneration facilities.

8. A partially-open power cogeneration system of claim 1, wherein during steady-state system operation the cited open-portion of the system comprises the venting of excess re-circulated system exhaust gases and further wherein the system can be fully-closed during demand periods for increased system output capacity and/or the system apparatus means can be increased in rotating speed until a desired steady-state output condition is achieved and the system can resume its cited partially-open system operation.

9. A partially-open power cogeneration system of claim 1, wherein the recited master control panel can comprise expandable control and safety monitoring features for control integration with the power cogeneration system' complementing auxiliary apparatus systems' PLC control panels and a facilities power plant distributive control system (DCS), said safety monitoring and control design features being in accordance with American Petroleum Institute (API) specifications for industrial gas turbines (API 616) or aero-derivative gas turbines specification (API RP 11PGT), API 617 for centrifugal compressors (and applicable portions therein to be applied to hot gas expanders), API 619 for rotary positive displacement compressors, API 673 for special fans, added alternative safety monitoring as required both by API 560 for fired heaters for general refinery service and NFPA 85C for prevention of boiler and furnace explosions for collective control-integration within a central power plant distributive control system (DCS), and other prevailing commercial, industrial, or other facility site governmental jurisdiction codes and standards.